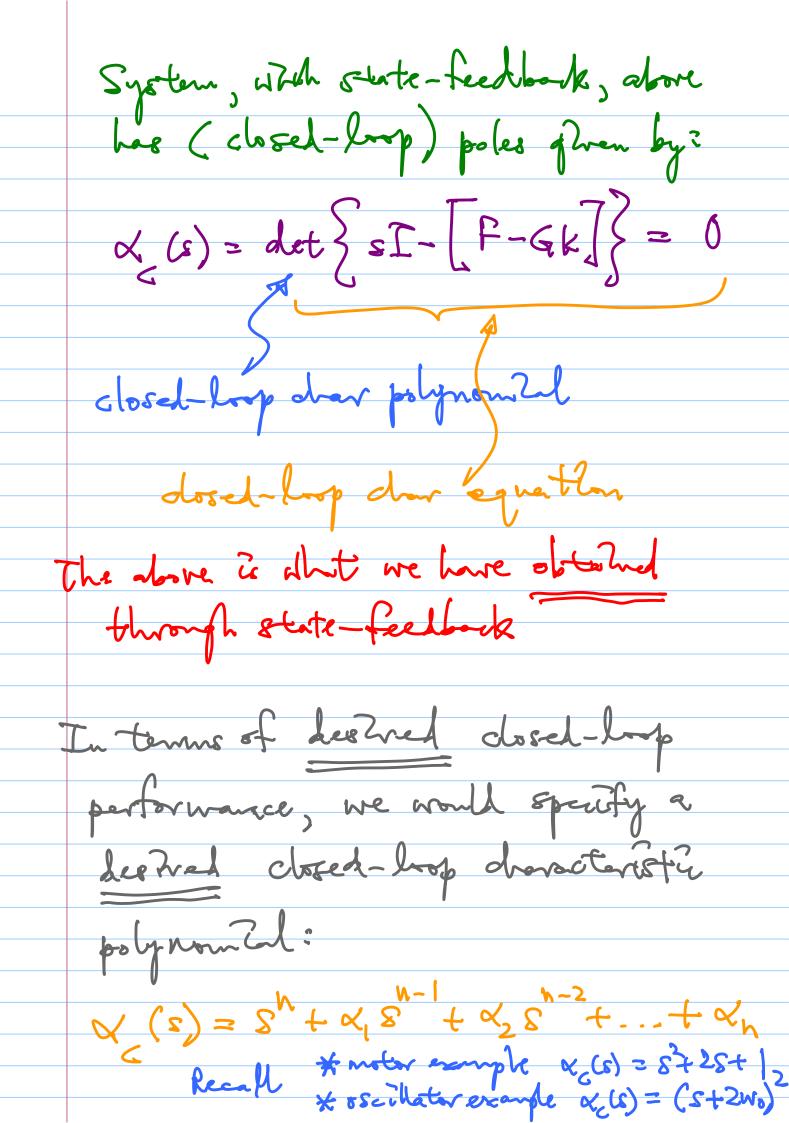
Summery x 2 fx + Gu assume system is "controllable" y = Hx + Ju 10, C=[GFGPG...Fh-16] Open loop system has pokes given als = x (s) = det { sI- f} = 0

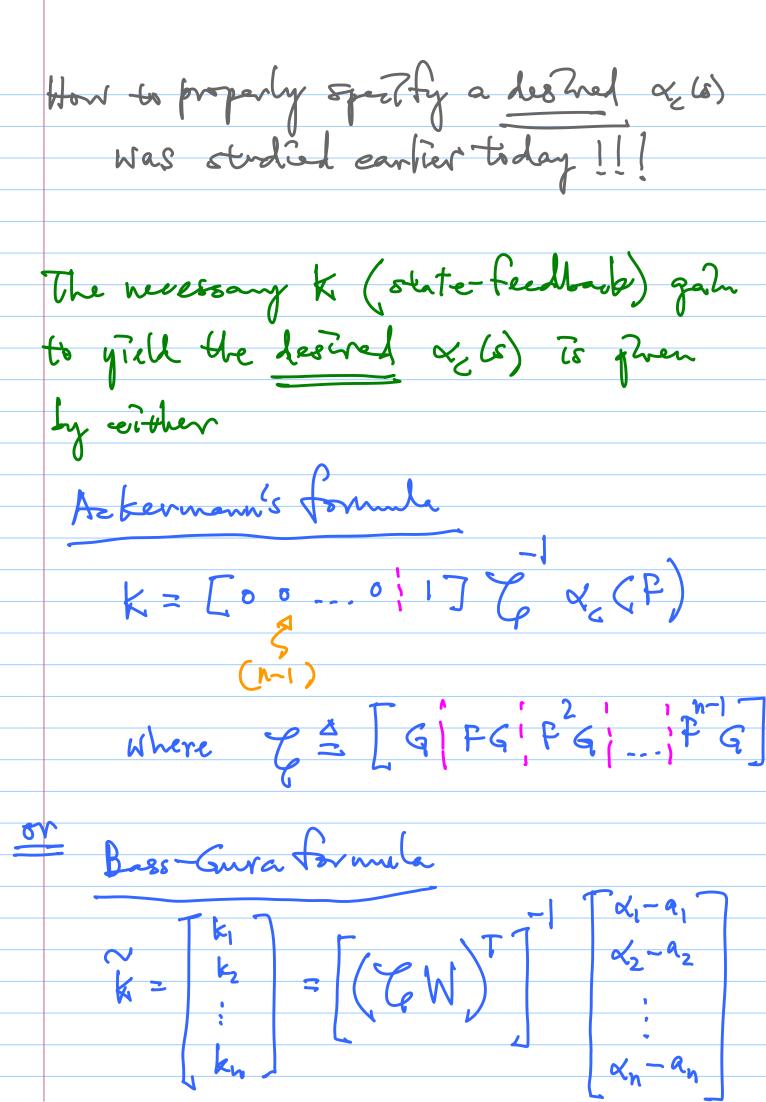
open-hop donateliste polynomial

of cs) = sh + a<sub>1</sub> sh - 1 + a<sub>2</sub> sh - 2 + ... + a<sub>n</sub>

open-hop donasteliste equation Openhoop system is not satisfactory
for precision control because of,
for example, \* no feedback to ensure tracking errors = 0

\* open-frop system dynamics are
not satisfactory (e.g. too slow?
unstable etc) Taking the approach of state-feedback,  $l = -k_1 x_1 - k_2 x_2 - \dots - k_n x_n$  $k=[k_1 k_2 \dots k_n]$   $= -k_1 \times -k_1 \times -k_1 \times -k_2 \times -k_2 \times -k_1 \times -k_2 \times$ With state-feedback, system how kn becomes: x=fx+Gm x = fx + q \ - kx \ ° = SF-GK x y = Hx + Ju





Transformathour between realizations
$$p = Tx$$

$$x = f(x + G, u)$$

$$p = f(x + G, u)$$

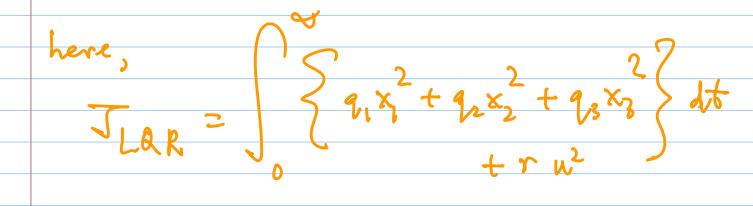
Selection of tole Locathons i.e. how to choose x\_(s) = s^n + x\_1 s^{n-1} + x\_2 s^{n-2} + ... t x\_n Approach # 1 = Prototype Response eg. ITAE tables JITAE = | t | y-r dt 2) Approach # 2 = Symmotric Root
Locus (SRLI) X = T x + Gu ; y = Hx Define a signal important to you ---

... called z where  $\Xi = H \times$ SEL method gives choice of d(s) Which infinises

JSRL = (p \geq + w) dt

Where (p > 0) Will need to brow the Symmetric Root 1 + p G<sub>0</sub>(-s) G<sub>0</sub>(s) = 0 p>0 where Z(s) = Z(s) = H SI-FSGRecall EE 2016 rook looms  $|+KG(s)=|+k\frac{b(s)}{a(s)}=0$ 

Approach #3 = Full optimization
Linear Anchotic Regulation approach x = fx t Gn This approach books at minimishy JLOR = \[ \left\{ \text{x}^T Q \times + \text{r} u^2 \right\} \] Q= a poortine-destrite matrix r: 2 postitue number For example, 47th Q= \ 0 0 93 9, 2, 2, 2, > 0; n=3



for next Wednesday's class,
we will beap-frog to
page 102 of the Lecture
Notes, on topic

"Introduction of Reference
Signal (Methods)"

And then, we will all be ready for Experiment I --!